

=> d 14 bib ab 1-9

L4 ANSWER 1 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1999:478264 CAPLUS

DN 131:263001

TI Chemisorption of acrylonitrile on the Cu(100) surface: A local density functional study

AU Crispin, X.; Bureau, C.; Geskin, V. M.; Lazzaroni, R.; Salaneck, W. R.; Bredas, J. L.

CS Centre de Recherche en Electronique et Photonique Moleculaires, Service de Chimie des Materiaux Nouveaux, Universite de Mons-Hainaut, Mons, B-7000, Belg.

SO Journal of Chemical Physics (1999), 111(7), 3237-3251

CODEN: JCPSA6; ISSN: 0021-9606

PB American Institute of Physics

DT Journal

LA English

AB The possibility of chemical grafting polyacrylonitrile onto transition metal electrodes via electropolymn. leads to promising applications in the fields of corrosion protection or metal surface functionalization. The initial step of the electrografting mechanism is the adsorption of the acrylonitrile monomer on the metal surface from solution. Here, the authors study theor. this adsorption process on the Cu (100) surface; d. functional theory is used in the local spin d. approximation to describe the electronic and structural properties of acrylonitrile adsorbed on Cu clusters. The chemisorption of acrylonitrile on the Cu surface is confirmed exptl. via XPS. The thermodyn. characteristics of the adsorption process are also studied via statistical mechanics. Finally, determining the influence of the Cu cluster size on the adsorption of acrylonitrile allows to extrapolate the properties of the acrylonitrile/Cu(100) surface from those of acrylonitrile /Cu clusters.

RE.CNT 87 THERE ARE 87 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 2 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN

AN 1998:807527 CAPLUS

DN 130:139731

TI Controlling the Electrografting of Polymers onto Transition Metal Surfaces through Solvent vs. Monomer Adsorption

AU Crispin, X.; Lazzaroni, R.; Geskin, V.; Baute, N.; Dubois, P.; Jerome, R.; Bredas, J. L.

CS Service de Chimie des Materiaux Nouveaux Centre de Recherche en Electronique et Photonique Moleculaires, Universite de Mons-Hainaut, Mons, B-7000, Belg.

SO Journal of the American Chemical Society (1999), 121(1), 176-187

CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

AB Electropolymn. of methacrylic monomers opens the possibility of chemical grafting a wide range of polymers onto transition metal surfaces. The electropolymn. of acrylonitrile and Et acrylate was carried out in a one-compartment cell, using a Ni working electrode and TEAP [tetraethylammonium perchlorate] electrolyte in different solvents; the choice of solvent is a critical parameter. D.-functional theory-based modeling of the interaction of solvent (acetonitrile, DMF, and pyridine) or monomer (acrylonitrile, Et acrylate) mols. with the Ni(100) metal surface was used to classify the interaction of organic mols. with the surface. The difference in surface binding-energy between monomer and solvent is given in a Frumkin-type isotherm and was used to explain the observed competitive adsorption of monomer and solvent at the metal surface. The first step in the electrografting mechanism is chemisorption

of the monomer at the electrode surface before cathodic polarization is applied; the chemisorbed monomer is therefore the first species reduced, giving rise to an adsorbed reactive intermediate, which is thus able to start the polymerization of a grafted chain.

RE.CNT 89 THERE ARE 89 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 3 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN  
AN 1998:735803 CAPLUS  
DN 130:72910  
TI Electrografting of acrylic and methacrylic monomers onto metals.  
Influence of the relative polarity and donor-acceptor properties of the monomer and the solvent  
AU Baute, Noelle; Teyssie, Philippe; Martinot, Lucien; Mertens, Marc; Dubois, Philippe; Jerome, Robert  
CS Center Education Res. Macromolecules, Univ. Liege, Liege, B-4000, Belg.  
SO European Journal of Inorganic Chemistry (1998), (11), 1711-1720  
CODEN: EJICFO; ISSN: 1434-1948  
PB Wiley-VCH Verlag GmbH  
DT Journal  
LA English  
AB The possibility of grafting a series of alkyl polyacrylates and polymethacrylates onto a Ni cathode by electropolymn. of the parent monomers was investigated and emphasized the importance of the solvent used. The intensity of the inhibition peak, which is the electrochem. mark of the cathode passivation as result of the polymer grafting, depended on both the polarity and the donor-acceptor properties of the solvent. The Gutmann concept was used to account for these exptl. results. An increase in the donicity of the solvent used for the electrochem. medium had allowed several polyacrylates and polymethacrylates [such as poly(Et acrylate), poly(Me methacrylate), and poly(2-trimethylsilyloxyethyl methacrylate)] to be electrografted onto Ni. This observation is consistent with a competition process between the monomer and the solvent for being adsorbed on the cathode and amassing in its very close vicinity. The outcome of this competition was controlled by the relative polarity (in case of low donicity) and the relative donor-acceptor properties (when the difference was high enough) of the monomer/solvent pair, and by the monomer concentration (in case of weak competition). A semiquant. relationship was observed between the monomer ability to be electrografted and the electron-accepting character of the vinyl  $\beta$ -C atom as measured by  $^{13}\text{C}$  NMR.

RE.CNT 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 4 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN  
AN 1998:101525 CAPLUS  
DN 128:263125  
TI Solvent effect on the electrografting of acrylonitrile on nickel  
AU Mertens, M.; Calberg, C.; Baute, N.; Jerome, R.; Martinot, L.  
CS B6, Sart Tilman, Center for Education and Research on Macromolecules (CERM), University of Liege, Liege, 4000, Belg.  
SO Journal of Electroanalytical Chemistry (1998), 441(1-2), 237-244  
CODEN: JECHES  
PB Elsevier Science S.A.  
DT Journal  
LA English  
AB The effect of solvent on the reductive electrografting of acrylonitrile (AN) onto nickel cathodes has been studied in DMF, a solvent for polyacrylonitrile (PAN), and in non-solvents that include acetonitrile (ACN), propylene carbonate (PC) and pyridine (PY). Electrografting responsible for the cathode inhibition has been observed for the first time in PC and PY. Not only the polymer-solvent interactions but also the intrinsic polarity of the solvent have an effect

on the intensity of the inhibition peak which is the signature of the electrografting reaction. Concentration of the monomer in the electrode double layer appears to decrease as the solvent polarity is increased, consistently with a more efficient displacement of the monomer by a more polar compound. That such a competition occurs is also supported by the effect of the nature and concentration of the conducting salt. The best

quality

films are formed in DMF, which is a solvent for PAN. Quartz microbalance expts. have emphasized the crucial importance of the potential range used for the AN electroredn., particularly in a solvent of the polymer.

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 5 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN  
AN 1998:91175 CAPLUS  
DN 128:141284  
TI Dynamic mechanical thermal and infrared analyses of polyacrylonitrile "electrografted" onto a metal  
AU Calberg, C.; Mertens, M.; Baute, N.; Jerome, R.; Carlier, V.; Sclavons, M.; Legras, R.  
CS Center for Education and Research on Macromolecules (CERM), University of Liege, Liege, 4000, Belg.  
SO Journal of Polymer Science, Part B: Polymer Physics (1998), 36(4), 543-553  
CODEN: JPBPEM; ISSN: 0887-6266  
PB John Wiley & Sons, Inc.  
DT Journal  
LA English  
AB Polyacrylonitrile (PAN) films have been "grafted" onto copper electrodes by cathodic polarization and analyzed by IR spectroscopy and dynamic mech. thermal anal. (DMTA). The dynamic mech. response shows two or three transitions depending on the film thickness and the potential deposition. The viscoelastic properties of "ungrafted" PAN films, e.g., solvent cast films of com. available PAN, are deeply different from those of "electrografted" films. The exptl. data support that "ungrafted" chains are paracryst. in contrast to the "grafted" ones which are essentially amorphous. Moreover, the irreversible transformation of the "grafted" PAN chains observed beyond 225°C is confirmed by Fourier transform IR (FTIR) anal. and ascribed to an intramol. cyclization of PAN into polyimine. This reaction occurs rapidly and at a comparatively low temperature with respect to "ungrafted" PAN, which suggests that the "grafted" chain configuration might be predominantly isotactic. The isotacticity and the amorphous structure appear to decrease as the thickness of the PAN film is increased. Literature data and the herein reported observations would suggest a dependence of the amorphous structure of PAN on the chain isotacticity.

RE.CNT 27 THERE ARE 27 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

L4 ANSWER 6 OF 9 CAPLUS COPYRIGHT 2007 ACS on STN  
AN 1996:342124 CAPLUS  
DN 125:11531  
TI The Electroreduction of Acrylonitrile: A New Insight into the Mechanism  
AU Mertens, M.; Calberg, C.; Martinot, L.; Jerome, R.  
CS Center for Education and Research on Macromolecules (CERM), University of Liege, Liege, 4000, Belg.  
SO Macromolecules (1996), 29(14), 4910-4918  
CODEN: MAMOBX; ISSN: 0024-9297  
PB American Chemical Society  
DT Journal  
LA English  
AB Several complementary electrochem. techniques were used to clear up the mechanism of the electrochem. reduction of acrylonitrile (AN) on

nickel. According to G. Lecayon et al. (1982), the electropolymerization of AN occurs in acetonitrile in the presence of tetraethylammonium perchlorate in such a way that polyacrylonitrile (PAN) is grafted onto the cathode. This electrochem. reaction was reinvestigated both in acetonitrile, a nonsolvent of PAN, and in DMF, a good solvent for the polymer. The key role of the reduction potential on the electrografting reaction was emphasized. The 2 electrochem. phenomena previously reported by Lecayon et al. were indeed confirmed, but now it is clear that the electrografting of PAN selectively occurs at the lower cathodic potential. At this potential, a PAN film is formed by a radical process and firmly secured onto the electrode, even in DMF. If the cathodic potential is further increased, the PAN film is easily removed from the metal and dissolves quickly in DMF. The transfer of one electron from the metal to the monomer occurs when the reduction is carried out at the greater cathodic potential. A nonadherent PAN film is then formed on Ni in acetonitrile, although the AN polymerization occurs in solution when acetonitrile is replaced by DMF. The AN polymerization is then consistent with an anionic process.

L4 ANSWER 7 OF 9 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on STN

AN 1999:686015 SCISEARCH

GA The Genuine Article (R) Number: 233MK

TI Investigation of the cathodic electro polymerization of acrylonitrile, ethylacrylate and methylmethacrylate by coupled quartz crystal microbalance analysis and cyclic voltammetry

AU Baute N; Martinot L; Jerome R (Reprint)

CS Univ Liege, Ctr Educ & Res Macromol, Sart Tilman B6, B-4000 Cointe Ougree, Belgium (Reprint); Univ Liege, Ctr Educ & Res Macromol, B-4000 Cointe Ougree, Belgium; Univ Liege, Lab Analyt Chem & Radiochem, B-4000 Cointe Ougree, Belgium

CYA Belgium.

SO JOURNAL OF ELECTROANALYTICAL CHEMISTRY, (24 AUG 1999) Vol. 472, No. 1, pp. 83-90. ISSN: 0022-0728.

PB ELSEVIER SCIENCE SA, PO BOX 564, 1001 LAUSANNE, SWITZERLAND.

DT Article; Journal

LA English

REC Reference Count: 18

ED Entered STN: 1999

Last Updated on STN: 1999

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB The cathodic electropolymerization of acrylonitrile (AN), ethylacrylate (EA) and methylmethacrylate (MMA), has been monitored for the first time by coupled electrochemical quartz crystal microbalance (QCM) and cyclic voltammetry analyses. These data have been compared to the previously published analyses for methacrylonitrile (MAN). At the potential E-pl of the less cathodic of the two voltammetric peaks observed (peak I), the polymer formed is anchored firmly to the cathode even in a good solvent for it, and it remains adsorbed when the voltammetric scan is repeated up to E-pl. In parallel, a linear relationship is observed between the frequency change recorded in situ by the QCM up to E-pl and the PAN film thickness measured ex-situ by ellipsometry. However, when potentials more negative than peak I are scanned, the polymer desorption (degrafting) occurs as assessed by solubilization in a good solvent. Polymerization is also resumed but in solution and no longer as grafted chains. The major difference between the acrylic monomers (AN and EA) and the methacrylic ones (MMA and MAN) is that part of the methacrylic chains are not grafted at E-pl. This coexistence of adsorbed and desorbed chains is not observed for the polyacrylic chains in that potential range. The mass of PAN deposited onto the cathode has been approximated from the film thickness and the Sauerbrey equation, so allowing the M-n of the grafted chains to be estimated. (C) 1999 Elsevier Science S.A. All rights

reserved.

L4 ANSWER 8 OF 9 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on  
STN  
AN 1997:923882 SCISEARCH  
GA The Genuine Article (R) Number: YH134  
TI Electrochemistry of N-vinyl-2-pyrrolidone and a non polymerizable analogue  
AU Calberg C (Reprint); Kroonen D; Mertens M; Jerome R; Martinot L  
CS UNIV LIEGE, CTR EDUC & RES MACROMOL, B-4000 LIEGE, BELGIUM; UNIV LIEGE,  
LAB ANALYT & RADIOCHEM, B-4000 LIEGE, BELGIUM  
CYA BELGIUM  
SO POLYMER, (JAN 1998) Vol. 39, No. 1, pp. 23-29.  
ISSN: 0032-3861.  
PB ELSEVIER SCI LTD, THE BOULEVARD, LANGFORD LANE, KIDLINGTON, OXFORD, OXON,  
ENGLAND OX5 1GB.  
DT Article; Journal  
FS PHYS  
LA English  
REC Reference Count: 20  
ED Entered STN: 1997

Last Updated on STN: 1997

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB According to previous studies, the electropolymerization of  
N-vinyl-2-pyrrolidone fits a cationic mechanism with grafting of the  
polymer onto the platinum anode.

However, this article shows that the pyrrolidone substituent of N-VP is  
also involved in the anodic reaction in addition to the polymerizable  
vinyl double bond. This additional reaction in the potential range of  
interest was confirmed by the electrochemical oxidation of a non  
polymerizable analogue of N-VP, i.e. N-methylpyrrolidone. Therefore, at  
least two mechanisms can contribute to the electrodeposition of a polymer  
film in a solvent of poly N-VP: electrografting and polymer  
branching and/or crosslinking by species stemming from the  
electrooxidation of the pyrrolidone rings. (C) 1997 Elsevier Science Ltd.

L4 ANSWER 9 OF 9 SCISEARCH COPYRIGHT (c) 2007 The Thomson Corporation on  
STN  
AN 1995:626138 SCISEARCH  
GA The Genuine Article (R) Number: RV088  
TI ON THE ELECTROCHEMICAL POLYMERIZATION OF ACRYLONITRILE AND  
N-VINYLPYRROLIDONE - NEW INSIGHT INTO THE MECHANISM  
AU JEROME R (Reprint); MERTENS M; MARTINOT L  
CS UNIV LIEGE, CTR EDUC & RES MACROMOLEC, B6, B-4000 LIEGE, BELGIUM  
(Reprint); UNIV LIEGE, CHIM ANALYT & RADIOCHIM LAB, B-4000 LIEGE, BELGIUM  
CYA BELGIUM  
SO ADVANCED MATERIALS, (SEP 1995) Vol. 7, No. 9, pp. 807-&.  
ISSN: 0935-9648.  
PB VCH PUBLISHERS INC, 303 NW 12TH AVE, DEERFIELD BEACH, FL 33442-1788.  
DT Article; Journal  
FS PHYS; ENGI  
LA English  
REC Reference Count: 10  
ED Entered STN: 1995

Last Updated on STN: 1995

\*ABSTRACT IS AVAILABLE IN THE ALL AND IALL FORMATS\*

AB Communication: The protection of metals against environmental attack  
can be achieved by coating the metal with a protective organic film. Poor  
adhesion of the organic film to the metal surface has, however, limited  
the success of this approach. Here it is demonstrated that  
polyacrylonitrile can be electrografted onto a nickel surface  
producing a strongly adherent film. The transformation of the organic  
film could also open the way to new polymer-metal composites.

=> d his .

(FILE 'HOME' ENTERED AT 08:26:01 ON 19 MAR 2007)

FILE 'CAPLUS, MEDLINE, BIOSIS, SCISEARCH' ENTERED AT 08:26:13 ON 19 MAR 2007

L1	166 S ELECTROGRAFT?
L2	37 S L1 AND ACRYLONITR?
L3	27 DUP REM L2 (10 DUPLICATES REMOVED)
L4	9 S L3 AND PY<2000

=>

	Type	L #	Hits	Search Text	DBs	Time Stamp
1	BRS	L1	1	"5350323".pn.	US-PGPUB; USPAT	2007/03/19 04:26
2	BRS	L5	1	diazonium same acrylonitrile same electrode	US-PGPUB; USPAT	2007/03/19 06:49
3	BRS	L4	105	diazonium same acrylonitrile	US-PGPUB; USPAT	2007/03/19 06:50
4	BRS	L6	2	gold electrode same insulat\$ polymer	US-PGPUB; USPAT	2007/03/19 07:34
5	BRS	L7	571	gold electrode same (silicon or silicon dioxide)	US-PGPUB; USPAT	2007/03/19 07:35
6	BRS	L8	17	17 and acrylonitrile	US-PGPUB; USPAT	2007/03/19 07:51
7	BRS	L9	3479	silver salt and acrylonitrile	US-PGPUB; USPAT	2007/03/19 07:51
8	BRS	L10	0	silver salt and acrylonitrile polymer film	US-PGPUB; USPAT	2007/03/19 07:51
9	BRS	L11	16	silver salt and acrylonitrile polymer	US-PGPUB; USPAT	2007/03/19 07:52
10	BRS	L12	1	silver salt same acrylonitrile polymer	US-PGPUB; USPAT	2007/03/19 08:10
11	BRS	L13	0	silver salt same electroactive polymer	US-PGPUB; USPAT	2007/03/19 08:10
12	BRS	L14	15	silver salt same conducting polymer	US-PGPUB; USPAT	2007/03/19 08:17
13	BRS	L15	775	silver same conducting polymer	US-PGPUB; USPAT	2007/03/19 08:17
14	BRS	L16	98	silver same electroactive polymer	US-PGPUB; USPAT	2007/03/19 08:18

	Comments	Error Definition	Errors
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			



	Type	L #	Hits	Search Text	DBs	Time Stamp
15	BRS	L17	0	"ag.sup.+" same electroactive polymer	US- PGPUB; USPAT	2007/03/19 08:19

	Comments	Error Definition	Errors
15			

	Type	Ref #	Hits	Search Text
1	BRS	S1	1	"5766934".pn.
2	BRS	S2	3	"683583".ap.
3	BRS	S5	0	electrograft and (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone")
4	BRS	S3	5	"614516".ap.
5	BRS	S4	0	electrograft same (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone")
6	BRS	S6	3	electrograft same (polymer)
7	BRS	S7	18	electrografting same (polymer)
8	BRS	S8	18	S6 or S7
9	BRS	S9	31	electrografting
10	BRS	S11	655	electrode same (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone")
11	BRS	S10	8543	electrode and (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone")
12	BRS	S12	113	electrode same (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone") same insulat\$
13	BRS	S16	831	electropolymer\$
14	BRS	S13	4	electrode same (pvp or polyvinylpyrrolidone or "n-vinyl pyrrolidone") same insulat\$ polymer
15	BRS	S14	743	electrode same insulat\$ polymer
16	BRS	S17	0	electropolymer\$ same pvp
17	BRS	S15	12	S14 and (insulat\$ polymer same (pvp or pmma))
18	BRS	S18	2	electropolymer\$ same pmma
19	BRS	S19	26	electropolymer\$ same polyvinyl\$

	DBs	Time Stamp	Comments	Error Definition
1	US-PGPUB; USPAT	2007/03/19 02:19		
2	US-PGPUB; USPAT	2007/03/19 02:03		
3	US-PGPUB; USPAT	2007/03/19 02:23		
4	US-PGPUB; USPAT	2007/03/19 06:48		
5	US-PGPUB; USPAT	2007/03/19 02:20		
6	US-PGPUB; USPAT	2007/03/19 02:21		
7	US-PGPUB; USPAT	2007/03/19 02:21		
8	US-PGPUB; USPAT	2007/03/19 02:21		
9	US-PGPUB; USPAT	2007/03/19 02:22		
10	US-PGPUB; USPAT	2007/03/19 02:23		
11	US-PGPUB; USPAT	2007/03/19 02:23		
12	US-PGPUB; USPAT	2007/03/19 02:30		
13	US-PGPUB; USPAT	2007/03/19 02:40		
14	US-PGPUB; USPAT	2007/03/19 02:33		
15	US-PGPUB; USPAT	2007/03/19 07:33		
16	US-PGPUB; USPAT	2007/03/19 02:40		
17	US-PGPUB; USPAT	2007/03/19 02:40		
18	US-PGPUB; USPAT	2007/03/19 03:08		
19	US-PGPUB; USPAT	2007/03/19 03:11		

	Errors
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	
18	
19	

	Type	Ref #	Hits	Search Text
20	BRS	S21	2	electropolymer\$ same ("n-vinyl-2-pyrrolidone" or "n-vinyl-pyrrolidone" or nvp)
21	BRS	S20	11	electropolymer\$ same acrylonitrile

	DBs	Time Stamp	Comments	Error Definition
20	US-PGPUB; USPAT	2007/03/19 04:06		
21	US-PGPUB; USPAT	2007/03/19 04:26		

	<b>Errors</b>
20	
21	